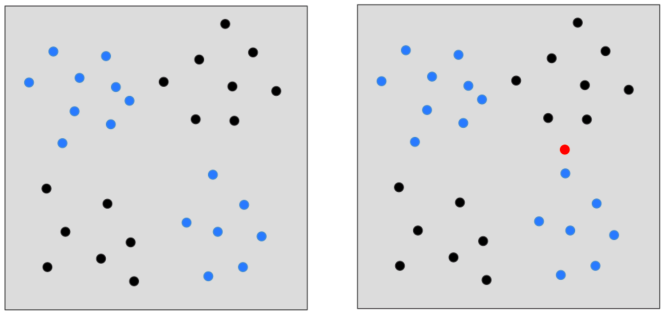
Kevin Romero Peces-Barba
kromero8@ucsc.edu
1635745

CMPS 142 - Spring 2018

Homework 1 - Problem 5

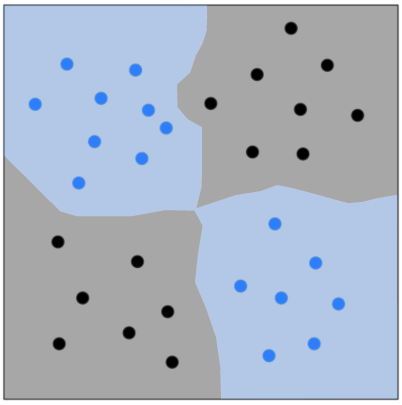
In this problem, you will strengthen your understanding of the KNN algorithm. Each of the following figures shows a dataset. Each dataset contains examples from two classes, black and blue.



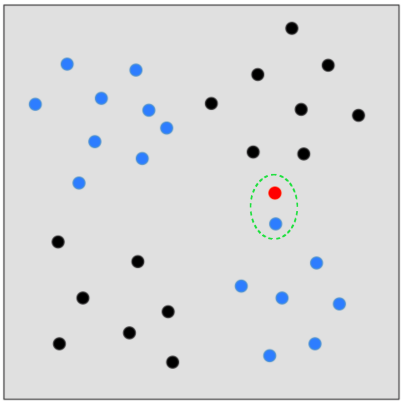
(a) Question about Training in KNN (b) Question about Testing in KNN

Figure 1: Figures for question about KNN

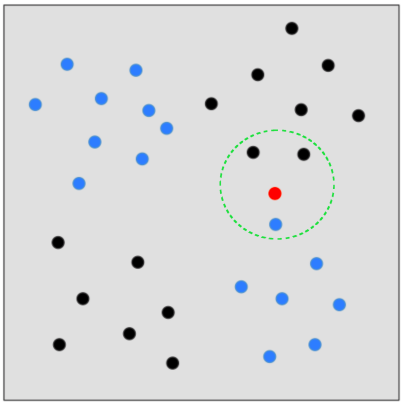
1. Consider Figure 1(a) for this part of the question. Draw the decision boundaries of 1NN classifier for the datasets. Assume that the classifier works with Euclidean distance. You don't need to be super precise.



2. Consider Figure 1(b) for this part of the question. What label would a KNN classifier predict for the red point if (a) K=1, and (b) K=3?



For K=1, the 1-nearest-neighbor would be the blue dot (represented in the doted circle). For this reason, the red dot would be classified as blue.



For K=3, the 3-nearest-neighbours are the one in the green circle. These are two black and one blue. Because there are more black ones, the red circle would be classified as black.